DOCUMENT RESUME

ED 232 110 CG 016 804

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TITLE Relaxation Training: A Stress Management Model for Schools.
PUB DATE Mar 83
NOTE 36p.; Paper presented at the Annual Convention of the American Personnel and Guidance Association (Washington, DC, March 20-23, 1983).
PUB TYPE Information Analyses (070) -- Reports - General (140) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Adjustment (to Environment); Adolescents; Anxiety; Children; Cognitive Development; Coping; *Curriculum Enrichment; Elementary School Curriculum; Elementary Secondary Education; Mental Health; Models; *Relaxation Training; Secondary School Curriculum; *Stress Management; Stress Variables; Well Being

ABSTRACT

Research findings produce a positive argument for the inclusion of relaxation training in the school curriculum. Since today's children face a great deal of stress, they must learn coping techniques. Learning to relax at will is one method of learning to survive, because the relaxation response is incompatible with anxiety; the child learns to manage stress rather than to be managed by it. The school curriculum affords an important opportunity for the structured and organized learning of stress management. Such a program improves self-management skills and self-concept, strengthens the right hemispheric abilities of the brain and such faculties as creativity, and improves various abilities to attain achievement. The second section of this paper addresses five basic considerations in the introduction of a school relaxation program: (1) will implementation require additional personnel?; (2) how much inservice do teachers and other staff need?; (3) how much time in the instructional program does the technique require?; (4) what materials are appropriate for implementing the relaxation program?; and (5) what success can the student expect? A discussion, with specific suggestions for materials and procedures, based on two relaxation research studies, is provided for each of the five questions. A seven page reference list and a list of relaxation program materials with ordering information are appended. (WAS)

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RELAXATION TRAINING: A STRESS MANAGEMENT MODEL FOR SCHOOLS

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Paper presented at:
1983 Annual Convention
American Personnel and Guidance Association
Washington, D.C.
March 20-23, 1983

CG 016804

RELAXATION TRAINING: A STRESS MANAGEMENT MODEL FOR SCHOOLS

Introduction

Relaxation training is one of the primary methods for dealing with excessive stress. One bases the training on the premise that an individual can be taught willfully to elicit the relaxation response, the exact opposite of the usual bodily response when fear and anxiety arise. Each person seems to have one's own physiological way of reacting to stress, whether by tensing the back and neck muscles, breathing rapidly, increasing the heart rate, or manifesting other physiological and biochemical responses. The body's attempt to counteract excessive stress can produce tension and interfere with coping in the context of intellectual and social settings.

In considering relaxation training, it is important to understand that nature has provided humans with homeostatic mechanisms, such as those mechanisms that regulate fluid and electrolytic balance, blood pressure, heart rate, and wound healing, in addition to those mechanisms to readjust more complicated functional disorders that are of a learning and emotional nature. The concept assumes that when a person is exposed to excesssively distrubing stimulation such as emotional or physical trauma, the brain has the potential to utilize natural biological processes to reduce the distrubing consequences of the stimulation. The techniques that elicit the relaxation response are designed to support and facilitate the natural self-healing mechanisms that already exist in the body. Thus, the emphasis in a relaxation program is to train an individual to assist the body's natural systems in their inherent potentials of self-regulatory adjustment.

The relaxation state is induced by a variety of techniques, some of which are appropriate for the classroom. The techniques include progressive relaxation, autogenics, breathing exercises, visual imagery, meditation, quieting reflex, certain approaches to hypnosis, various biofeedback techniques, and some elements

of behavioral therapy. For school purposes, the teacher may combine a variety of techniques, as is evident in the more recently developed exercises. Good illustrations are the programs developed by Lupin (1977), Peace, Harmony, Awareness: A Relaxation Program for Children, and Matthews (1982a), Relaxation Exercises for Young People. Each program starts with exercises based on progressive relaxation in order to teach the child the meaning of tense and relaxed muscles and then moves gradually to breathing exercises, autosuggestions, and guided imagery.

In order for the relaxation program to be effective in teaching the coping skill, the child requires regular practice over a period of time at school. Intellectual understanding of stress reduction techniques is of little value without firsthand experience and enough practice to make the technique automatic. Because of the need for practice like the other skills in school, authorities (Lupin, Braud, Braud, and Duer, 1976 ; Rossman and Kahnweiler, 1977; McBrien, 1978; Dinkmeyer and Dinkmeyer, 1979; Holland, 1980; Truch, 1980; Proeger, 1980; Omizo and Williams, 1981; and Matthews, 1982b) recommend that relaxation training become part of the school curriculum for exceptional and regular programs, perhaps eventually becoming the Fourth "R" in the curriculum. Authorities agree that it is far more practical in the long run to train children to handle stress more effectively than it is to continue to try to alter the external environment each time the situation becomes a problem.

The Need for a Stress Management Program

Young people today are faced with a greater variety of perceived pressures and anxiety-producing problems than previous generations. Peer pressure, school pressure, changes in the traditional nuclear family, even the changing economic structure and the overwhelming technology of our society, combine to induce stress situations in young people.

Society has changed at an alarming rate in the past twenty years, bringing a myriad of novel problems requiring adjustment. The traditional nuclear family is no longer the norm as the percentage of working mothers rises in either dual income families or in single parent families. No longer is there a parent or supervisor at home when the child leaves school for the day. Often children must adjust to a divorce, possibly a second or third marriage, as the divorce rate approaches 50 percent. This mobility of parental partners is an extreme form of the general mobility of the society. Change in the style of life becomes the only dependable constant, and a child's ability or lack of ability to adjust may affect performance in other areas.

While the community and world economy might not seem to concern the school child overwhelmingly, its effects may be far-reaching. The increasing cost of gasoline has cut travel and vacation time and scope and with them the important opportunity to unwind and escape everyday pressures. The rising unemployment rate, for example, is very distressing. A parent may be unemployed causing financial strain in the home. In troubled financial times, pressure increases for children to get good grades in school in order to go to college or to get a good job.

The schools themselves have changed in ways which, while positive, put additional requirements on students. Children in school today must adjust to different ethnic groups whom they may never have encountered before. Also, the recent trend toward minimum competency testing may make students feel they must constantly prove themselves, especially if students are already under pressure from home.

The results of these problems emerge in the children themselves. A general sense of hostility is apparent in the high number of behavioral problems. Depressed boys and girls take prescription drugs, while a large percentage of other children children take illegal drugs. According to Spencer (1979), on the sharp statistical rise are: teenage and child pregnancy; teenage and child alcoholism; teenage and child prostitution and pornography; teenage and child venereal disease; truancy;

illiteracy; and criminality. But the most terrible and surprising aspect is suicide, the third leading cause of death among American children, preceded by accidents and murder. While the number of children who end their own lives is not astoundingly high, the rate of childhood suicide is increasing radically. In the past decade it has risen more than 100 percent. And the rate of attempted suicides is rising even faster.

Keelan (1978) and Davis, Eshelman, and McKay (1980) list a number of other manifestations of coping behavior in young people. The list includes: running away from home; fighting; assaulting teachers; vandalism; and extreme anxiety about tests and other school work. These behaviors are symptomatic and may establish lifelong patterns of negative response to stressful situations.

All of these behaviors are negative outcomes of stress. In order to avoid these behaviors, children must learn to manage stress in a positive and constructive manner. Stress management training, such as relaxation training, is a skill which can help individuals throughout their lives.

Why Teach Relaxation Training?

The primary reason for teaching the skill of "willful relaxation" is for stress management. It is important to show the child that one can voluntarily regulate the psychological and physiological states of one's own body. And the child can do it with only minimal reliance on drugs, conditioning, and the intervention of others--in other words, with a minimum of external controls. Voluntary self-regulation is of primary importance in shaping and revitalizing children's self-image so that they can become more aware of themselves and also more aware of their relationships with others.

Being in control of the body is important to physical and mental health, indeed, the total mental and physiological outlook. K.B. Rotter (1966) spoke of the internal versus external expectancies as the locus of control. The locus of control represents the degree to which a person feels that what happens to one depends on

one's behavior--a feeling of internal control--as opposed to feeling it is dependent on chance, fate, or is under the control of powerful others--external control. However, internal locus of control is not something which is inborn; it must be learned by the individual. The well-known biofeedback authority, Barbara Brown (1977), voices the opinion that relaxation training has the tendency to turn the child's attention inward. Thinking about internal controls reduces the amount of attention paid to external factors and leads to a decrease in mental tension concerning social pressures. This conditioning, in turn, alters the significance that the individual attaches to external environmental situations and stimuli.

For some time the medical profession has capitalized on the body's natural healing power. Holistic medicine encourages the child to relax and manage that child's own health. The approach believes that a person can not only be well but also reach higher levels of energy, enthusiasm, and well-being than would be possible without the coping skill.

Just as the medical profession experiences secondary benefits from a program of relaxation training, the educational profession does also. Positive effects are evident in a variety of affective and cognitive behavior changes. Research shows that relaxation training assists children with developing self-management skills, building a positive self-image, improving right hemispheric abilities of the brain, and increasing certain aspects of achievement. These areas now will proceed in greater analytic detail.

Self Management Skills

The limited amount of research dealing with relaxation training shows its usefulness in the educational setting for changing affective behaviors. The majority of the literature deals with learning disabled or emotional disturbed children. One can surmise, however, that a treatment that is helpful for the exceptional child may be beneficial for the child in the regular classroom.

Also, no classroom is immune to the behavior problems of both regular and special education students. It is estimated that approximately 10 percent of all students in public schools have emotional problems severe enough to interfere with normal learning and social adjustment: for example, anxiety, phobic reaction, hyperactivity, fatigue, lack of attending skills, poor retention of content, poor self-image, and poor self-control. Just as one example of the severity of the problem, Miller (1970) did a study to determine the prevalence of hyperactivity in elementary schools and found that 1 in every 20 pupils and 1 in every 11 boys are affected by the syndrome. Recent research at Berkeley, the University of Oregon, and other educational centers suggests the problem is getting worse and that as many as 48 percent of all boys in American schools are either hyperactive, or have behavior problems that simulate hyperactivity (Walton, 1979).

Relaxation procedures help children develop more self-control. According to Lupin (1977) hyperactive children who learn relaxation procedures are less likely to cry, whine, or have temper tantrums. They are less irritable, less impulsive, and less distractible. One effect of relaxation training is that it allows children to develop a "stopping technique." As children learn more self-control, they will be able to take a deep breath and relax instead of plunging headlong without thought into a difficult situation. This procedure allows children to experiment with new behaviors and decide on a more desirable course of action.

The following studies show some of the research findings of children in the regular classroom and in exceptional programs. Relaxation training includes the various methods appropriate to children, that is, various forms of biofeedback, relaxation exercises on tape, and combinations of the two methods.

Braud and Braud (1974) indicated that using relaxation exercises on tape with 22 referred children (15 hyperactive, 6 behavior problems, and 1 autistic)

significantly reduced tension levels. Additionally, Lupin, Braud, Braud, and Duer (1976) in an unpublished study reported that the use of relaxation exercises with hyperactive children and their parents significantly altered some of the children's rated behaviors. Watson and Hall (1977) in an unpublished document discussed the evaluation of 86 children (grades 4 through 6) in regular and special education classes which were divided into groups receiving no treatment, placebo treatment, sensorimotor training, and relaxation training, and found the relaxed group showed significantly reduced hyperactive behavior over the control group.

Simpson and Nelson (1974) reported a preliminary study on breathing control and attention training for hyperactive children. The three experimental children were placed in a cubicle in which they received feedback concerning their breathing rate and the amount of discrepancy from a desired rate. The experimental children were also given attention training, while the control group worked only on tasks in the cubicles. The experimental group showed less breathing irregularity better performance on tasks, and better attending behavior.

Martin and Hershey (1976) studied the effectiveness of biofeedback techniques in reducing the hyperactive behavior of five hyperactive and four nonhyperactive elementary children. After training sessions, the children learned to raise their finger temperatures and increase their attending behavior.

Relaxation training and biofeedback were used by Rivera and Omizo (1980) with 36 hyperactive male children in a study measuring attention to task and impulsivity. They found significant differences between the control and experimental group, with the treatment proving beneficial for improving attention and decreasing impulsivity. Similar results were noted by Dunn and Howell (1982) in a study of 10 hyperactive males. By examining pre- and posttesting scores, one

can see that relaxation training increased accuracy and attending behavior, and decreased body movements while engaged in a quiet activity.

In a recent study Matthews (1982d) found positive significant differences in attendance, attrition, and disruptive behaviors between an experimental group who received relaxation training, and a comparable control group who did not receive training. The 62 preadolescents attended an eight-week volunteer summer program designed to teach beginning French.

Relaxation training is effective with hyperactive children who are normally treated by stimulant drug therapy (Braud, 1978). The advantage of relaxation training is that it works, is inexpensive, is ever-present, and takes a minimum amount of time to administer. Stimulant drugs are effective in decreasing over-activity and increasing attention span, but are less effective in the decrease of irritable, aggressive, explosive, or emotional behaviors that tend to remain after the symptoms of hyperactivity are no longer evident (Braud, 1978; and Denhoff, David, and Hawkins, 1971).

Matthews, the senior author of this paper, is the principal investigator of a research study in progress called Project Relaxation involving 532 seventh grade boys and girls from rural backgrounds in 9 school districts. Approximately 15 minutes of relaxation training using audio taped exercises is administered on each school day. After 2 months of training 1 mother reported that her daughter who had previously been on medication for migraine headaches, explosive behavior, and poor concentration was no longer using the drug. According to the mother, the daughter was now less distracted by outside noises and could concentrate better when studying, with results that appeared in improved grades in school. Furthermore, the mother reported that the girl retreated to her bedroom and practiced eliciting the relaxation response when she felt like exploding and by doing so,

had curbed losing emotional control, a situation which improved interpersonal relationships in the home.

Orne (1966) points out that school can be conceived as an agent of stress for which the child reacts with hyperactivity, and lack of attention. The stimulus, school, is defined as a stressor, not by its objective qualities, but rather by its effect on the individual. Relaxation training can provide the individual with the internal control needed to deal with the stimulus. Thus, the child will tend to be able to tolerate similar stimuli of somewhat greater intensity in the future. Orne concluded by emphasizing that in order to succeed, individuals must have control over their behavior.

Initial research on relaxation training demonstrates that the technique can help in the reduction or elimination of some of the common problems faced by children under stress in schools. If its effectiveness can be maintained and additionally built, then its continued use in the classroom is not only possible but highly probable.

Self-Concept

Relaxation training is important in the improvement of self-concept. Since self-concept is a global construct and encompasses the child's interpretation of that child's abilities or characteristics, research often deals with subaspects and not the totality of the construct. In reviewing the literature one finds that empirical data are limited with the exception of several subaspects. However, findings from the studies lead to some important and interesting revelations.

Using relaxation and biofeedback training, Omizo (1980b) found that the factors: aspiration, anxiety, and identification, changed significantly in the experimental group when compared with the control group. In another study with 56 hyperactive adolescent boys Omizo (1980a) found that relaxation training improved

the level of aspiration and internal locus of control.

Walton (1977) found that biofeedback training among preadolescent, adolescent, and college-age students had significant effects on self-concept, internalized locus of control, abnormal behavioral problems, and reading achievement. In these studies, students were involved in electromyographic biofeedback coupled with formal relaxation training which was a modification of autogenic training procedures. Students in a college sample were chosen at random from individuals registered in the special education introductory course who were found to have grade point averages below the 2.5 level and who indicated they were experiencing severe anxiety. As a result of training, moderate positive changes in self-image along with significant growth in grade point average as measured by final examination scores in their academic courses were found in the experimental group.

Anxiety, another factor in self-concept, is examined in a number of studies. Training in relaxation procedures teaches the child to reduce test anxious behavior and thus improve the cognitive process. A rippling effect is the improvement of school grades which in time improves the self-image one has of the ability to achieve.

As far back as 1975, Snyder was able to show that relaxation training is a powerful technique for reducing test anxiety, for changing the unpleasant attitude associated with test-taking, for increasing facilitating responsiveness to testing pressures, for positively changing perceptions of ability and of self when taking tests, and for reducing anxiety in relation to other specific situations or objects. In more recent years studies by Deffenbacker and Snyder (1976), Houssian and Lawrence (1978), and Reed and Saslow (1979) support the earlier findings.

Although it is difficult for a researcher to measure the total self-concept, the literature supports the claim for relaxation techniques assisting the child with self development. The rippling effects of the treatment are many because as negative behaviors decrease and interaction with peers and adults increases, self-

esteem and self-confidence build. Since there is a high correlation between self-concept and productivity, it appears that one can make a good argument for including relaxation training in the curriculum.

Right Hemispheric Abilities of the Brain

Relaxation training teaches the child to enter a consciousness state known as alpha. Although both hemispheres of the brain emit alpha waves, the right hemisphere specializes in the skills associated with the alpha consciousness level. Alpha rhythms allow the brain to be open-focused and receive stimuli simultaneously, a condition necessary for intuitive and creative thinking. In the vast majority of children, music, crafts, dance, visualization, arts and sports are based in the simultaneous mode of intuitive thought. Schools have historically placed emphasis on the specialization of the left hemisphere of the brain--sequential and analytical thinking. In order to develop the whole child, however, both analytical and intuitive modes of processing information must be developed.

For a number of years Robert Ornstein (1977) studied the brain, combining both personal knowledge gained from the study of mysticism and the scientific approach to consciousness. He indicated that the creative process involves the interaction of the left and right hemispheres of the brain to bring a new idea to the surface. The right hemisphere involves creativity and intuition; and the left hemisphere includes the rational, intellectual processes. Ornstein believes that it is the polarity and the integration of these two modes of consciousness, the complementary workings of the intellect and the intuition, which underlie man's highest achievements.

Achievement

Eastern cultures of the world claim great success in achievement when

individuals practice daily with methods of relaxation which produce the alpha brain wave state. For instance, Georgi Zozanov (1969), a Bulgarian at the University of Sofia, found that by teaching the brain to relax from all stress, the mind could learn at a rate from 5 to 50 times faster and far more efficiently. The method now is known as Suggestopedia, and has proven that hundreds of people effortlessly learned a foreign language, the vocabulary and grammar of which were equivalent to a two- to three-year college course, in as little as sixty days. Follow-up studies revealed, also, that as late as a year afterwards virtually none of the material had been forgotten.

In the United States where the primary emphasis in society is on analytical skills, overwhelming success is difficult to show except in increases in achievement due to test anxiety reduction and the attention span increase as a result of muscle relaxation in the hyperactive child. Traditionally, beta brain waves were associated with cognitive skills. In recent literature, however, the alpha state is connected with long-term memory and creativity. According to Danskin and Walters (1973), individuals who produce the greatest amount of alpha rhythms while speaking with their eyes open show the greatest memory retrieval. They further say that a state of reverie, approached through relaxation training, is linked with creativity, an ability discussed in the previous section.

Examples of memory retrieval are reported in the book, Super-Learning, by Ostrander and Schroeder (1979). With relaxation techniques, students at Iowa State University learned a whole semester of Spanish in 2 weeks and had fun so doing. They also reported that students in Washington, D.C., learned Latin in a fraction of the usual time and that students in California learned a Slavic language 3 times faster.

Other research on achievement includes the following.

Florence Schale (1970) found that students at Northwestern University when taught to relax to the alpha state, learned to read more rapidly. From 1 to 5 percent of her students developed the ability to read at rates of over 20,000 words per minute.

Harlem (1975) used the technique with elementary grade students in the regular classroom. He received positive results using autogenic training with black second graders. Relaxation trained students demonstrated superior performance in the Matching Familiar Figures Test, forward and backward digit span tasks, a paired associate task, and problem approach exercises. Trained students responded with increased flexibility to task demands as evidenced by more productive task approaches than control group students. The treatment was effective with both high and low achieving male and female pupils. Treatment gains were maintained over time.

According to Schultz and Walton (1979), at the Child's Service Demonstration Center, located in Provo, Utah, an extensive project was carried out during 1974 and 1975 which evaluated remediation programs for children with learning and behavior problems. These children, ranging from seventh to twelfth grades, were involved in remediation which included biofeedback training. At the conclusion of the project, it was found that there was a significant positive change in mathematics ability and a significant decrease in underlying anxiety. It was also found that the reading achievement scores and positive study habits of the students involved in biofeedback training showed a marked gain.

Parsky (1975) investigated the effects of four different reading treatments on reading disabled children. Electromyographic feedback training was used to suppress subvocalization, when combined with individualized reading instruction. A total of 24 sixth-grade students from 2 elementary schools were involved in the project. At the conclusion of an eight-week training period, the students

involved showed significant reduction of subvocalization in silent reading, whereas the control group showed no reduction in subvocalization. Significant gains in vocabulary were also found in the experimental group.

Two studies are reported with increases in achievement on the Wide Range Achievement Test as a result of relaxation training. A pilot study using four boys diagnosed as learning disabled by criteria of the State of Texas was done by Carter and Russell (1978a). Training sessions were conducted for 10 weeks, 1 time per week, 1 hour per session with 10 minutes of electromyographic feedback. Cognitive functioning and academic gains were assessed by pre- and posttreatment administration of the Wide Range Achievement Test. During the 10-week period (.19 of a year), the average gain of the four boys on the test was .65 of a year for reading, .67 of a year for spelling, and .52 of a year for arithmetic. Using electroencephalographic procedure, Patmon and Murphy (1978) report improved reading achievement on the Wide Range Achievement Test in a study of hyperactive adolescent learning disabled students.

In a recent study, Matthews (1982c) found slight gains in achievement scores of rural preadolescents who studied a foreign language but the gains were not statistically significant. However, the gains were made with less instructional time since the first 15 minutes of the day were used for relaxation procedures.

As one can easily see, the relationship between relaxation training and learning in the United States is an area needing much further research. There appears to be a great deal about the functioning of the brain and achievement in regard to the alpha state of which educators are presently unaware. After a careful examination of the literature, one can see no detrimental cognitive affect of relaxation as part of any school service; the trends are positive for inclusion of relaxation training in the school curriculum.

Implementation of a Relaxation Program

When school administrators anticipate a curriculum change, they need answers to several specific questions. The questions have to do with personnel, materials, and predicted outcomes with children in relationship to cost factors. To be specific then, the following questions need answers before the introduction of a relaxation program in the school occurs.

1. Will implementation require additional personnel?
2. How much inservice do teachers and other staff need?
3. How much time in the instructional program does the technique require?
4. What materials are appropriate for the implementation of the relaxation program?
5. What success can the student expect?

In answering the questions, the senior author uses experience with two relaxation research studies, Project SPEED LEARN (Super Power for Effortless Digest of Language for Expression with Alpha Rhythms in Nature) and Project Relaxation (Academic and Psychosocial Effects of Relaxation Training on Rural Preadolescents). This paper has already referred to the two studies, but to refresh the memory, Project SPEED LEARN (Matthews, 1982c) involved biofeedback (EEG) and relaxation exercises using autogenic techniques with rural preadolescents, ages 10 to 14, who attended a voluntary summer program for learning French. Project Relaxation is a study in progress with 532 children in the seventh grades in 10 middle schools in 9 rural school districts. The trends extrapolated from the 2 projects serve as information and guides for administrators, teachers, and other school personnel interested in implementing a program of relaxation procedures.

Will Implementation Require Additional Personnel?

The only personnel needed to institute a program of relaxation are the teachers of the regular and exceptional classrooms and perhaps a counselor to coordinate materials. Relaxation training, in the authors' preliminary judgement, should be for all children because all students need the skill for immediate and future stress management. Although the program requires no extra personnel, it does require change in attitudes of faculty. For the program to be successful, the staff must believe first that the student has the potential to learn to control the internal functions of the mind, body, and state of emotional balance. Second, the teachers must possess the attitude that relaxation training develops a coping skill which needs daily practice for refinement and sustaining. And the last requirement is for the teachers to accept, without begrudging, the time designated in the school curriculum for practice.

How Much Inservice Do Teachers Need?

The amount of inservice will vary with the knowledge and skill the staff possesses in relationship to stress management. Faculties involved in burnout prevention programs are no doubt aware of relaxation techniques and are prepared to work with children with only orientation sessions. Other faculty may need education in theory and first-hand experiences before embarking on a relaxation program for children.

In Project Relaxation teachers and principals received approximately 15 hours of inservice work before implementing a preplanned curriculum. The program uses relaxation exercises on audiotapes for the cassette recorder. Two inexpensive biofeedback instruments per child give feedback to the children. The two instruments are the wrist temperature indicator, a product of Bio-Temp, Incorporated, and the GSR^2, a product of Thought Technology, Ltd.

The wrist indicator, worn like a wrist watch, utilizes crystal technology which makes the instrument very sensitive to skin temperature changes. Pre- and postreadings are recorded daily for the children in the experimental group to assess the success of the class with relaxation.

The GSR^2 unit, a small training device which fits in the palm of the hand with metal sensors for the fingers, is used periodically with the children. The galvanic skin response measures autonomic arousal by recording the changing resistance of the skin and feeding the information back to the child by a tone changing in pitch. Since the tone is not recorded, temperature readings are recorded on the days the GSR^2 is used also.

In spite of the prepared curriculum designed to adjust for differences in the teacher variable, Project Relaxation's preliminary findings show differences in the facility of children to relax in various classrooms. In Table 1, an observer sees the mean gain between pre- and postreadings on the wrist indicator. An increase in wrist temperature is generally believed to demonstrate a more relaxed body. A careful examination of the table shows as much as 3° difference in mean temperature increase between the children in the classrooms of teacher 15 and teacher 10. Recognizing that some of the variance may be attributable to physical factors other than the behavior of the teacher, the degree of difference suggests teacher variable as a factor.

Thus, the amount of inservice depends upon the readiness of the staff to function in a relaxation program. Some members may need much more assistance than others. After the initiation of the program careful monitoring is necessary to identify teachers who need help with the program.

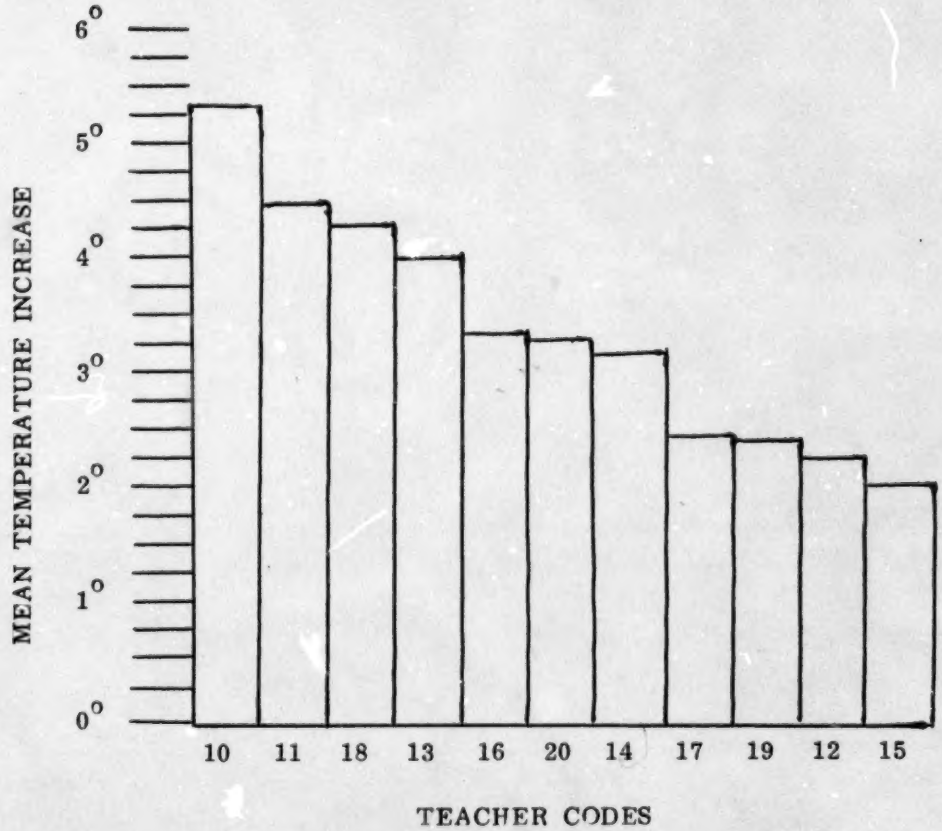
How Much Time in the Instructional Program Does the Technique Require?

The average time in the curriculum devoted to relaxation exercises is from

TABLE 1

TEACHER DIFFERENCES IN AVERAGE

INCREASE IN WRIST TEMPERATURE



15 to 20 minutes 1 or 2 times per day. Project Relaxation devotes 15 minutes in the morning during the first part of the day, either during homeroom or social studies period. Research shows that children relax much more quickly than the average adult; therefore, long periods are not needed (Kater and Spires, 1975; and Matthews, 1982c). Although the authors do not have data to support the claim, they feel that relaxation training programs are more effective if a specific time is designated in the morning and afternoon to practice exercises--preferably first in the morning and immediately after lunch. After the technique is learned, formal exercises on tape are no longer necessary. Simple cue words or phrases such as "relax," "feel the warmth," or "feel the heaviness" should induce relaxation.

What Materials Are Appropriate for the Implementation of the Relaxation Program?

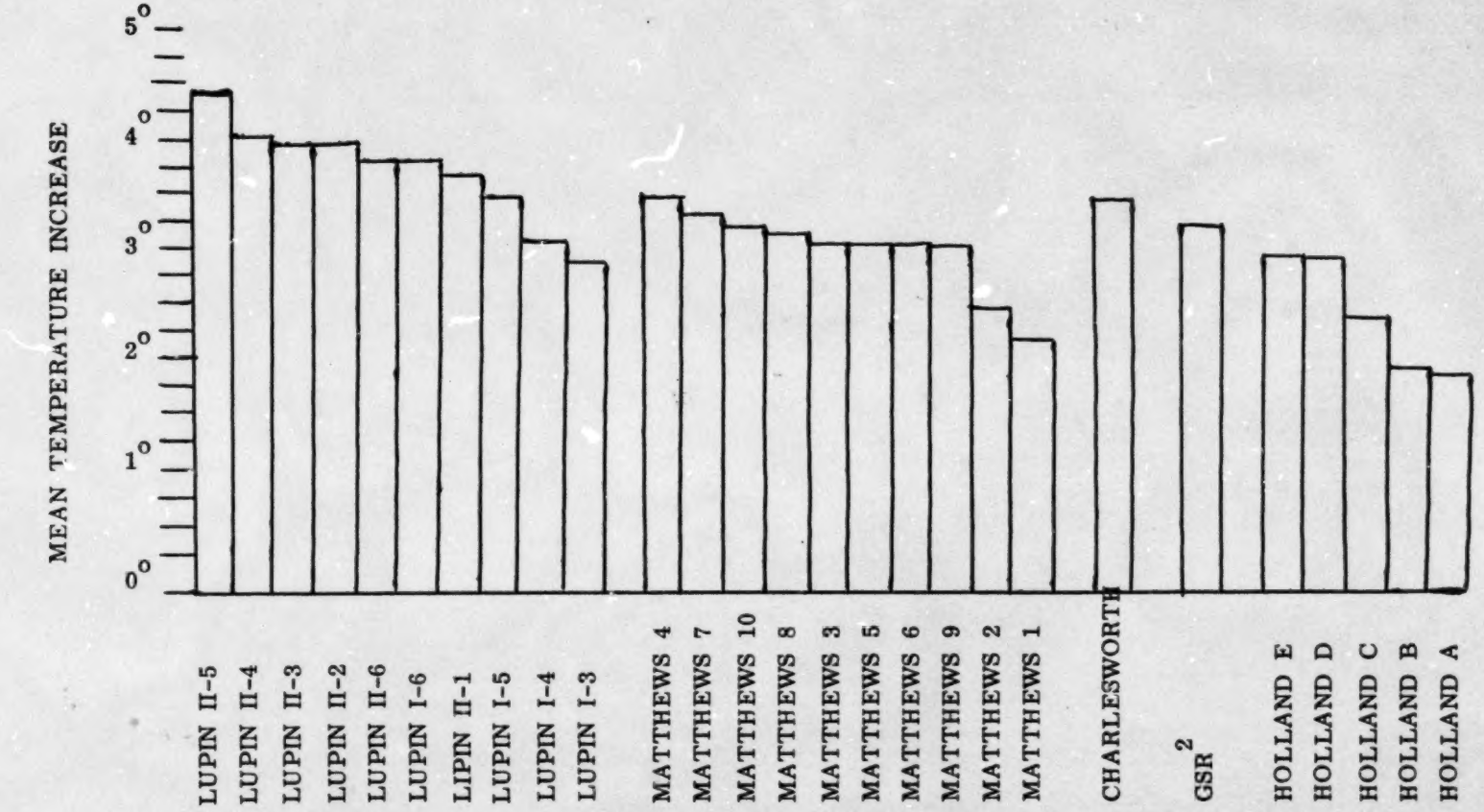
Since there is a variety of techniques which induce the relaxation response, school personnel should select the most appropriate technique for children. Project Relaxation gives some data which may be helpful in the selection process.

The Project uses 3 sets of material and 2 individual tapes. All the relaxation exercises are on cassette tapes for the recorder. The 3 sets of material are Lupin's Peace, Harmony, Awareness: A Relaxation Program for Children (1977), Holland' Quieting Reflex Training for Young People, (1980), and Matthews' Relaxation Exercises for Young People (1982a). The exercise, "Autogenic Relaxation," is from Charlesworth's The Relaxation and Stress Management Program (1981) and the other exercise accompanies the GSR^2 monitor. See Appendix A for more information about the programs.

Upon careful examination of Table 2 which gives the average increase in temperature by tape for 13 weeks, one will notice that all the tapes are effective in producing the relaxation state because the mean rise in temperature for the

TABLE 2

AVERAGE INCREASE IN WRIST TEMPERATURE FOR EACH TAPE OVER THE THIRTEEN WEEKS



274 students in the study is from 2.1°to 4.4° F., but certain exercises are more effective than others. Such factors as length of tape contribute to some of the variance because Holland's and Matthews' exercises are 10 minutes or less and the Lupin, Charlesworth, and GSR[2] exercises are 15 minutes or more. However, the trend in data suggest that exercises developed with a combination of autogenic and visual imagery techniques are superior after the child understands the meaning of tense and relaxed muscles and the physiological signs of the body associated with relaxation. In Project Relaxation the exercises in the sets of material which produced the greatest gains in temperature use visual imagery and autosuggestions, a technique recommended by autogenics. Lupin, Braud, Braud, and Duer (1976) recognized the value of visual imagery in their early research and suggested that large amounts of controlled sound and visual imagery may promote, with continued use, the continuing interest of the child.

Therefore, materials needed for the implementation of a relaxation program are few. A set or several sets of relaxation exercises developed for children, and a cassette tape recorder for each teacher starts a school on a stress management program with children. With experience, teachers learn to make their own relaxation exercises. Inexpensive biofeedback instruments for providing feedback to the children about their internal functioning increase student motivation, but biofeedback devices are optional.

What Success Can the Student Expect?

The degree of success of achieving the relaxation state depends upon the individual child's ability to concentrate on internal functioning. However, few students in both Project SPEED LEARN and Project Relaxation failed to relax, according to measurements with various biofeedback instruments (EEG, wrist indicator, and GSR[2]). With formal training the prognosis is very good for the child

to learn the coping skill of eliciting the relaxation response at will. After the body learns to respond, practice at school and home is essential to success.

Project Relaxation used wrist temperature as a measure of relaxation. If the relaxation training is effective, wrist temperatures should increase from the beginning of the training tape until the end. The measurement of this increase is the difference between the pretest temperature reading and the posttest temperature reading in degrees Fahrenheit. Also, as the students become more familiar with the relaxation process, they should be more nearly successful at relaxing and raising their skin temperature. Thus, the average increase in temperature should increase over time.

Therefore, it is important to determine whether practice improves students' relaxation skills. Table 3 reports the increases (prereading to postreading difference) in mean wrist temperature for each of the thirteen weeks. The means range from 2.22 to 4.10. Figure 1 presents the same data in a time-series graph. There appears to be a general increase in the ability to raise wrist temperature, indicating that practice may be an important factor in learning relaxation skills. The decrease toward the end of the thirteen week period is likely due to the effect of the Christmas holidays which occured between week twelve and week thirteen. In examining these increases over time, the effect of practice is the major concern. Prior to the thirteenth week, (during the two-week Christmas vacation period) the students received no practice. The decline in skills following this break seems to lend further support to the hypothesis that practice improves relaxation skills.

A Pearson product moment coefficient of correlation was computed between the week and the mean increase in wrist temperatures. A correlation of .59 was found which is significant at the .05 level. This indicates that the mean change increases as the weeks progress.

In summary, the prediction for success for the child learning the skill of willful relaxation is very good. However, stress management depends on the

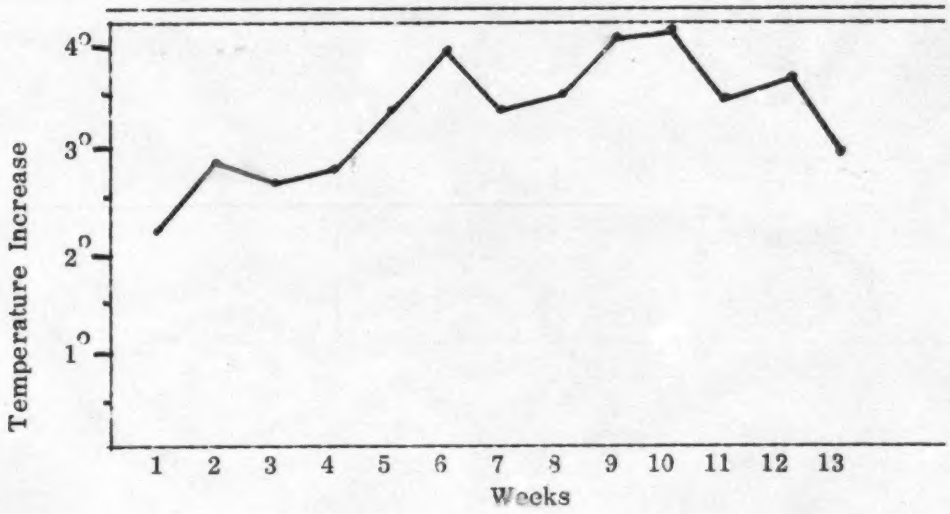
Table 3

Weekly Increases in Wrist Temperatures (Experimental Group)

Week	Mean	St. Dev.
1	2.22	2.44
2	2.83	2.58
3	2.62	2.43
4	2.73	2.20
5	3.32	2.70
6	3.95	3.19
7	3.34	3.07
8	3.47	2.92
9	4.02	3.13
10	4.10	3.06
11	3.43	2.92
12	3.59	2.95
13	2.98	2.59

Figure 1

Time Series Graph of Weekly Increases in Wrist Temperatures



use of the skill and use, as it is with all the other skills taught in school, depends upon the child's free choice with the support of the parent.

Summary

Research findings produce a positive augument for the need for the inclusion of relaxation training in the school curriculum. In the face of heavy factors for stress upon children of today, the children must learn coping techniques not just for success, but for survival. Learning to relax at will is one method of learning to survive, because the relaxation response is incompatible with anxiety. In other words, as the child learns to cope, the personality grows and the character firms. The child learns to manage stress rather than to be managed by it.

It is in the school curriculum, therefore, that the best opportunity for structured and organized learning of stress management occurs. Research demonstrates the need of such a program. There is a rationale for teaching relaxation training first to teachers and then to students. Self-management skills and self-concept improves. Strengthening of right hemispheric abilities occurs. Some faculties necessary for improvement, including creative and other right-hemispheric activities, become more noticeably active. Various abilities to attain achievement improve.

The implementation of the program is not expensive and depends upon the attitudes of school personnel. Working together, the school personnel gain knowledge of the necessary techniques. Inservice training, of course, is essential, as well as the availability of time and instructional materials. With these fundamentally simple yet disciplined components, the prediction for success becomes positive for the students in affective and cognitive behaviors, as well as in improvement in general health. The school should

prepare the child for the worlds of today and tomorrow by including relaxation training as the Fourth "R" in the school curriculum.

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APPENDIX A

Materials Appropriate for Relaxation Programs in Schools

Relaxation Exercises

1. Peace, Harmony, Awareness: A Relaxation Program for Children by Mimi Lupin

   Order from: Teaching Resources — Price $ 79.95
   50 Pond Park Road
   Hingham, Massachusetts

2. Q.R. for Young People (ages 10 +) by Margaret Holland

   Order from: Q.R. Institute-South — Price $ 49.50
   8509 North 29th Street
   Tampa, Florida 33604

3. Kiddie Q.R. (ages 5-10) by Liz Stroebel

   Order from: Q.R. Institute — Price $ 49.50
   119 Forest Drive
   Wethersfield, Connecticut 06109

4. The Relaxation and Stress Management Program by Edward A. Charlesworth

   Order from: Biobehavioral Publishers — Price $ 29.95
   and Distributors, Inc.
   P.O. Box 1102
   Houston, Texas 77001

5. Relaxation Exercises for Young People (ages 10 +) by Doris B. Matthews

   Information from:
   Doris B. Matthews
   P.O. Box 1715
   South Carolina State College
   Orangeburg, South Carolina 29117

Biofeedback Instruments

Wrist Temperature Indicator

Order from: Bio-Temp Products, Inc. — Price $ 10.00
1950 West 86th Street
Indianapolis, Indiana 46260

GSR^2

Order from: Thought Technology, Ltd. — Price $ 38.00
2193 Clifton Avenue
Montreal, Quebec
Canada H4A 2N5